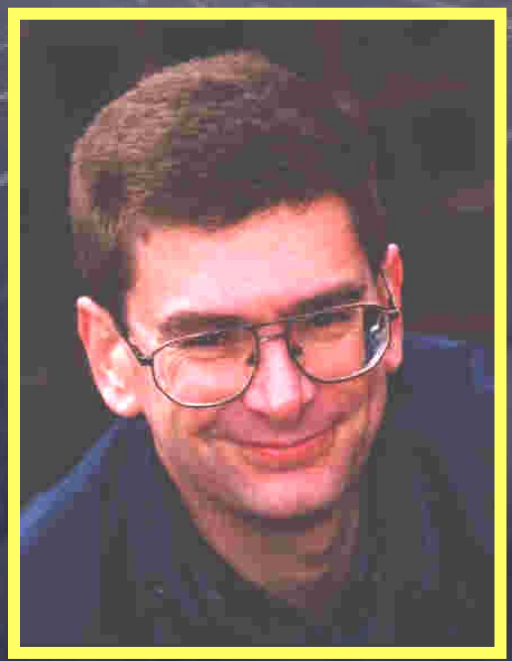
Motorcyclists' Personal Protective Equipment

The history and benefits of standards



Speaker:

PAUL VARNSVERRY

Principal UK Technical Expert - BSI PH/003/9

UK Delegate to CEN/TC 162/WG9

Special Advisor to UK Police

THE BRITISH ACCREDITATION BUREAU

CERTIFIED PRACTITIONER

SWEET & MAXWELL CHECKED 2005 EXPERT WITNESS

www.pva-ppe.org.uk

In the World
there are
TWO
distinct categories of
motorcyclists' apparel

The “marked”

CE..

= “*Conformité Européen*”

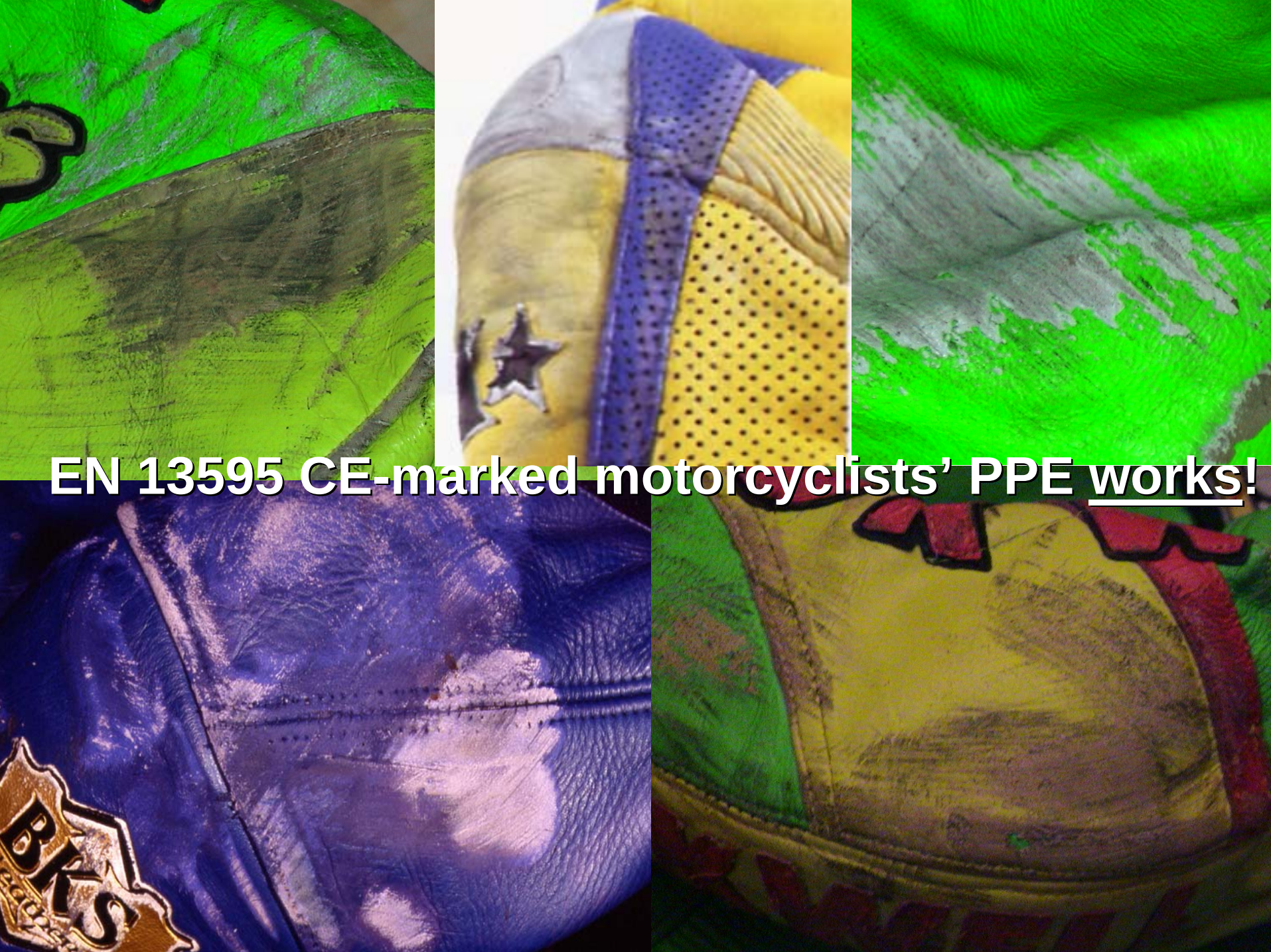
Independently tested and approved in accordance with the requirements of the EU Personal Protective Equipment (PPE) Directive

…and the “unmarked” ‘CE’

= “*Caveat Emptor*”

“Let the buyer beware”

Untried and unproven – until the owner puts them to “the test”!


EN 13595 CE-marked motorcyclists’ PPE works!

Would you be confident in claiming these garments to be “protective”?

Timeline to Standards

1984 – First steps by ACU

1988 – 1989: ACU Standard drafted

1989: ACU Standard cancelled

1989: Dr Willson meets Mr Petrovich

1990: First meeting: BSI PSM 34/3

1991: First meeting: CEN/TC 162/WG9

1994: Cambridge Standard published

1994: SATRA technical specification published

1997: EN 1621-1 published

2002: EN 13594, EN 13595 & EN 13634 published

2004: Publication of EN 1621-2

PPE = PERSONAL PROTECTIVE EQUIPMENT

Defined by EU Council Directive 89/686 as:

"…any device designed to be worn or held by an individual for protection against one or more health and safety hazards"

Responses given by the services of the Commission, after consultation of the committee set up by the Directive, to questions relating to the implementation of the Directive.

Q. 1: Scope of the Directive 89/686/EEC regarding motorcyclists' garment and additional protection features

A (amended 6/12/2002):
As far as this garment shelters from climate conditions such as heat, cold and humidity it is an object for private use. As such it does not fall under the scope of the PPE Directive (89/686/EEC Annex I .3)

If a manufacturer explicitly claims, or implies in sale literature and /or advertisement, that a garment offers protection because of specific additional features, these additional features shall be qualified as "PPE". As such they must comply with the provisions of the PPE Directive.

The specific features may materialise in e.g. impact protectors for limb and/or back, pads for elbow and /or shoulder and protection from cuts and abrasions (not exclusive listing of examples)

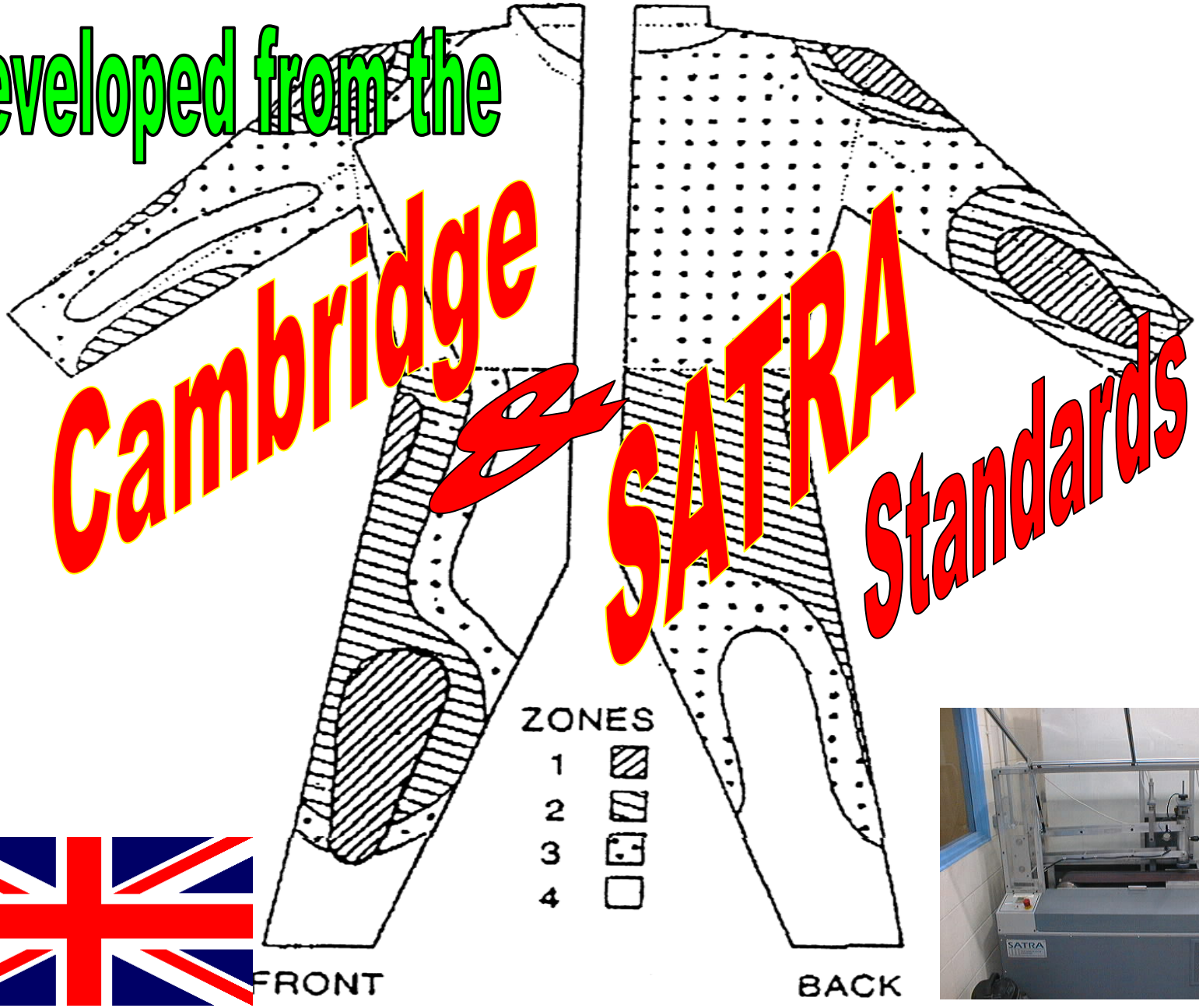
It follows that protectors to be placed in non-protective garments are PPE: the manufacturer has to provide the information related to the PPE as specified in the Directive together with the garment. For these protectors, as for any other detachable PPE, the information about the correct way of placing, fixing and detaching these PPEs must be given by the manufacturer.

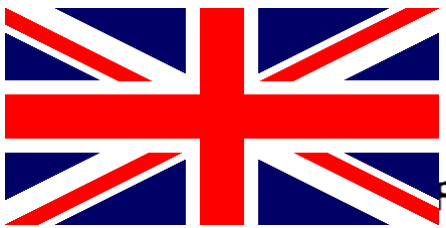
If the manufacturer claims, or implies in sales literature and/ or advertisement, that the whole garment provides special protection in addition to that provided by individual protectors, the whole garment must comply with all the essential requirements of Directive 89/686/EEC.

Notes:
(1) The same argument applies to clothing designed for sports for which specific clothing already exists.
(2) Helmets designed to protect against shocks should always be classed as PPE, except for helmets for riders of two- or three-wheeled motor vehicles, which are specifically excluded from the Directive (Annex I, point 5).

Technical development of the CEN Standards

Developed from the Cambridge & SATRA Standards





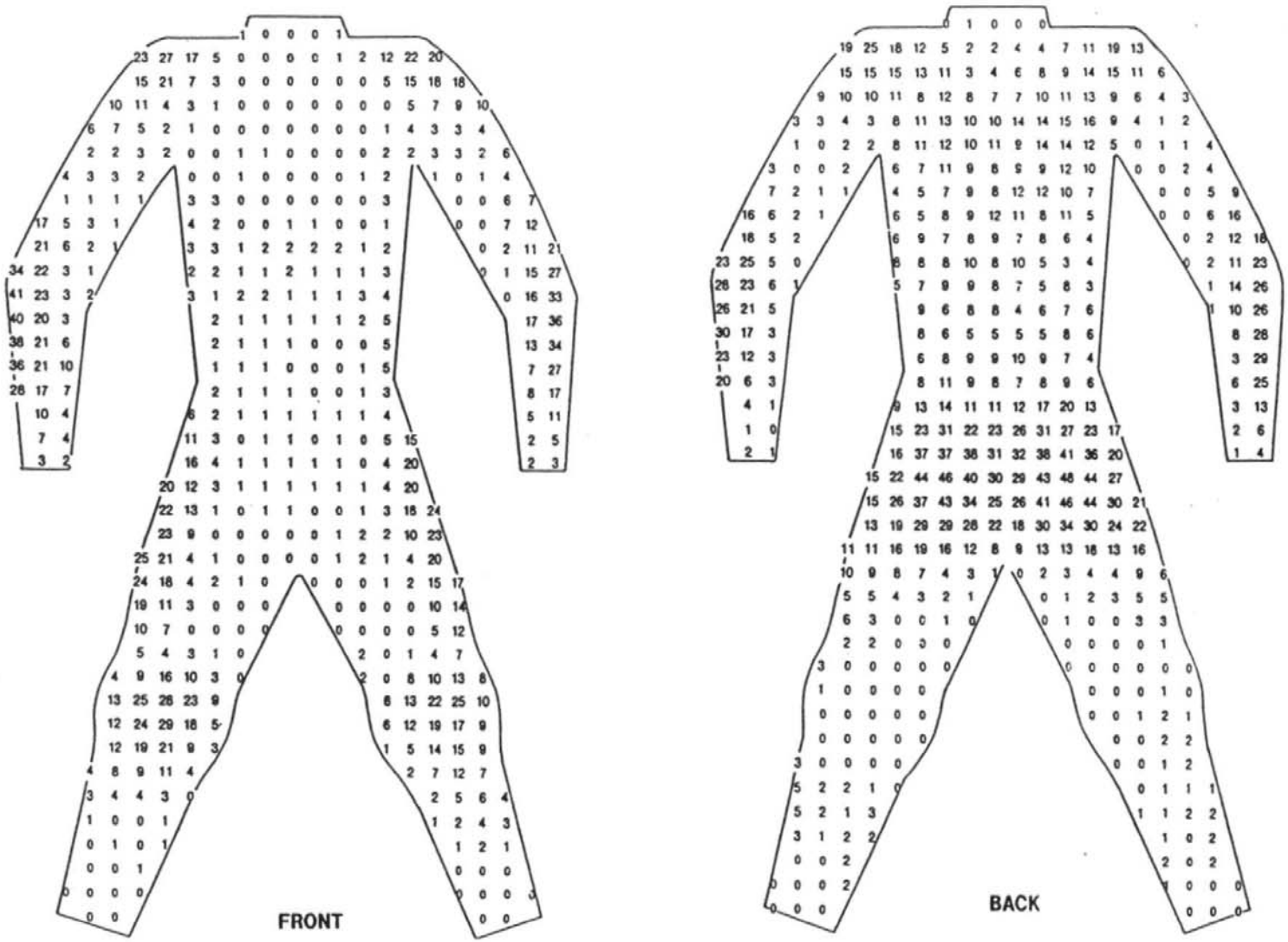
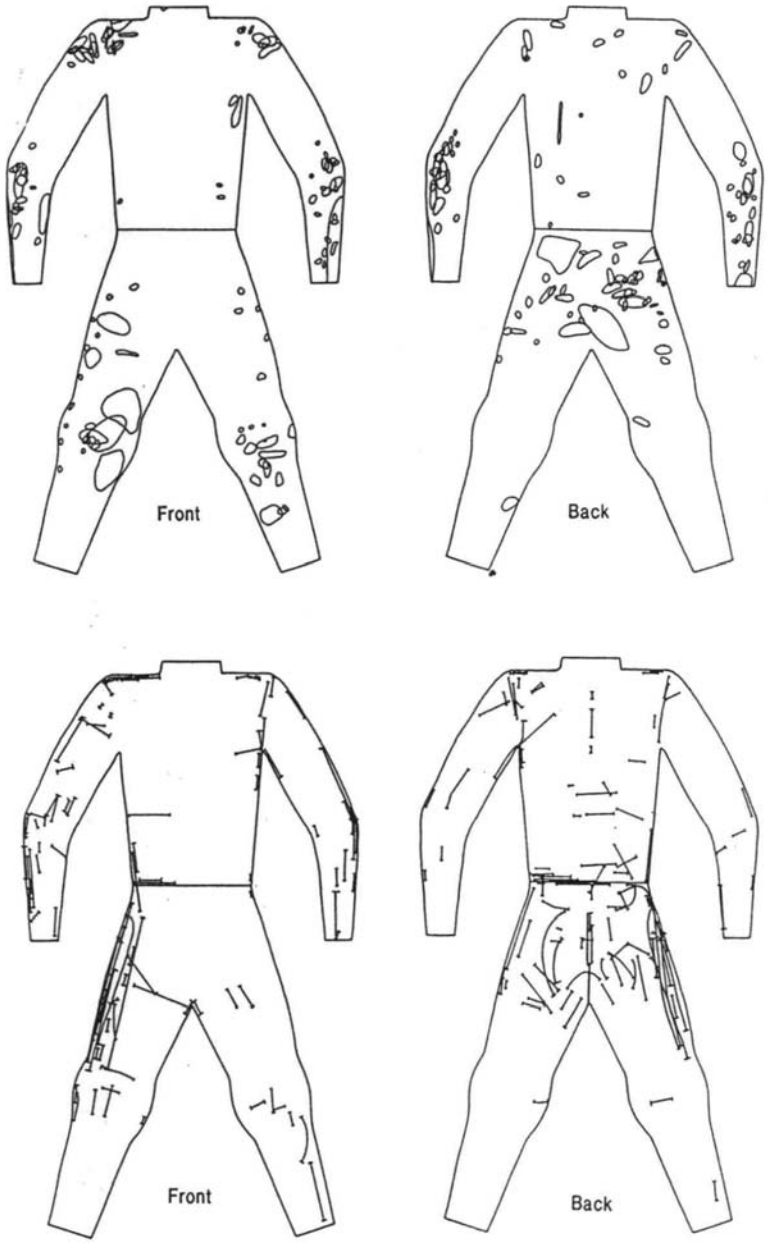


FIG. 1. Distribution of abrasion damage on the fronts and backs of 100 suits. Numbers denote the number of suits with damage at that point.



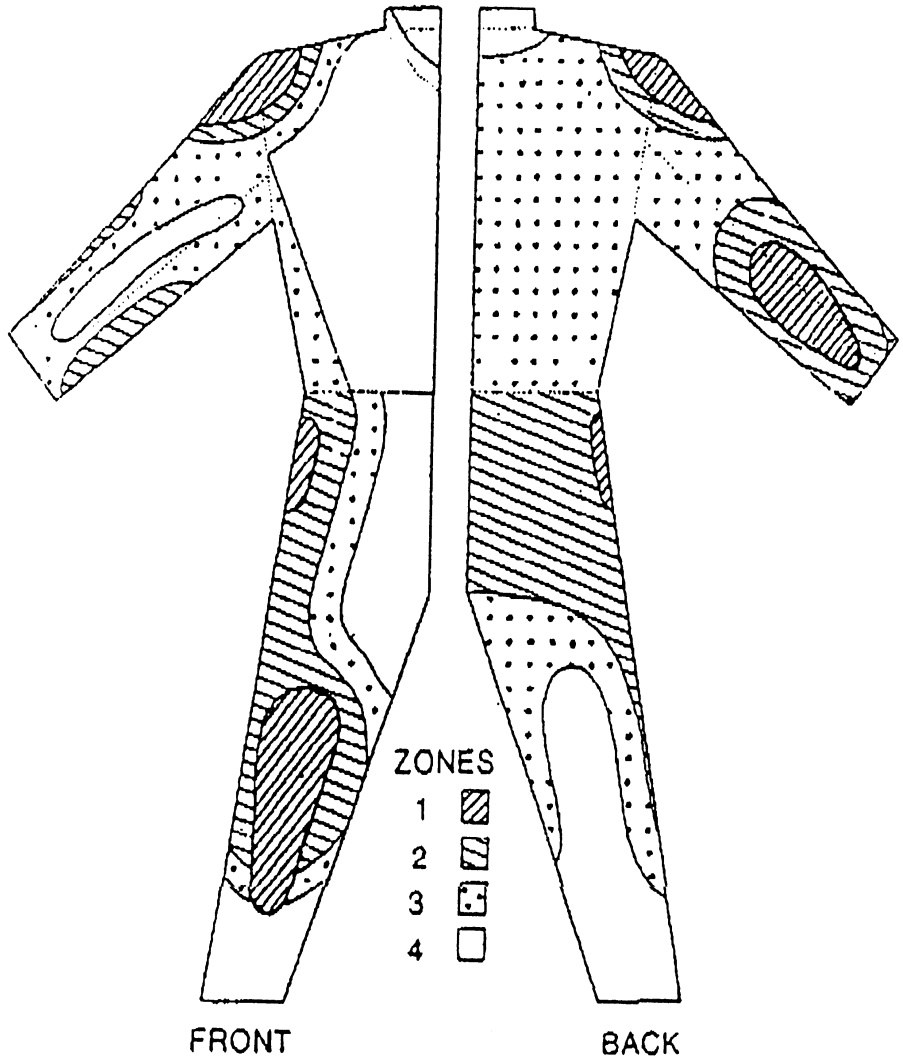


FIG. 2. Distribution of abrasion holes and tears, and the seam and zip damage on 100 suits.

TABLE 1--Mean performance values in abrasion, burst and cut tests of the classes of crashed clothing, and proposals for normal and high performance limit values for new clothing.

Zone	Class of crash damaged clothing			Ageing correction factor	Proposed performance limit values	
	Poor	Adequate	Good		Normal	High
Abrasion resistance, s						
	n = 4	n = 10	n = 7			
4	1.5	2.7	4.3		>1.5	> 2.5
3	1.5	2.7	4.4	- 20%	>2.5	> 4.0
2	2.6	7.8	14.6		>7.0	>12.0
Bursting strength, kPa						
	n = 6	n = 9	n = 6			
4	340	490	520		>450	> 500
3	390	600	680	- 30%	>600	> 800
2	370	860	1270		>800	>1250
Impact cut penetration, mm						
	n = 4	n = 10	n = 7			
4	29.9	18.6	14.1		< 30	< 20
3	29.7	18.6	13.2	- 20%	< 25	< 16
2	>35	9.8	6.0		< 14	< 8

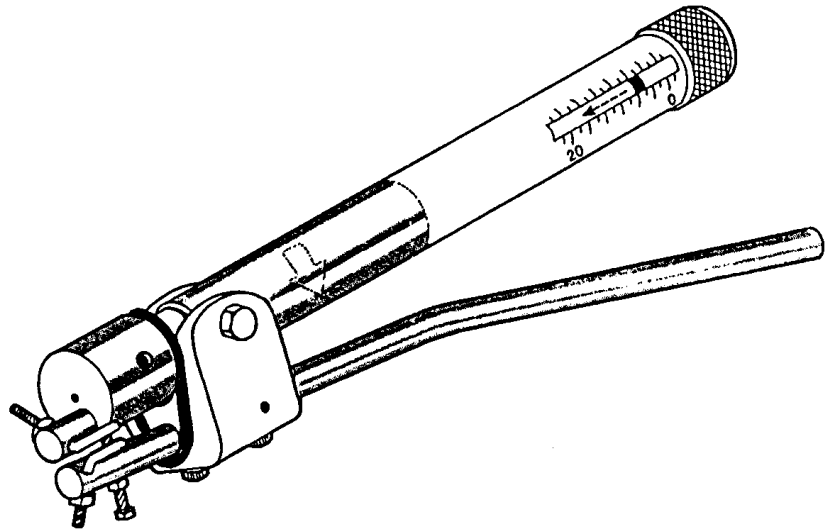
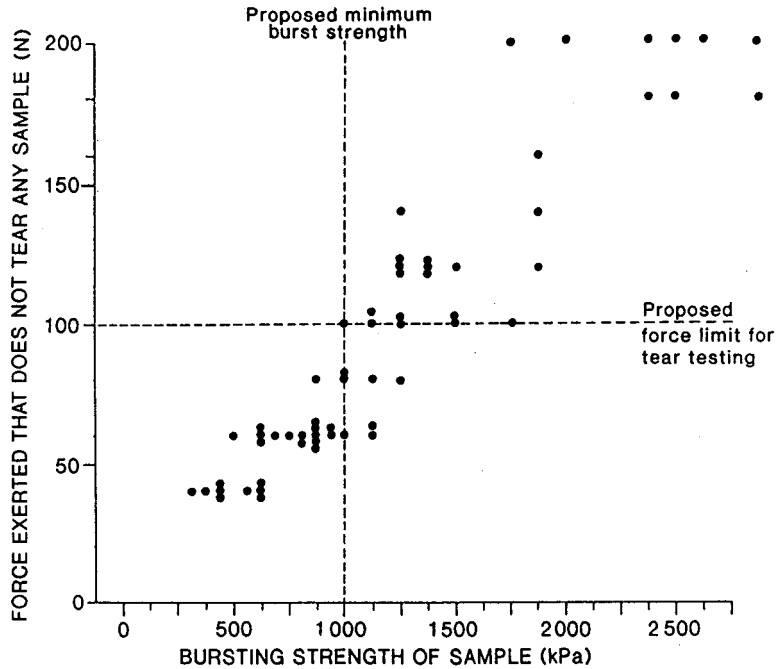


FIG. 7--Side acting torque wrench for assessing the tear strength of hide.



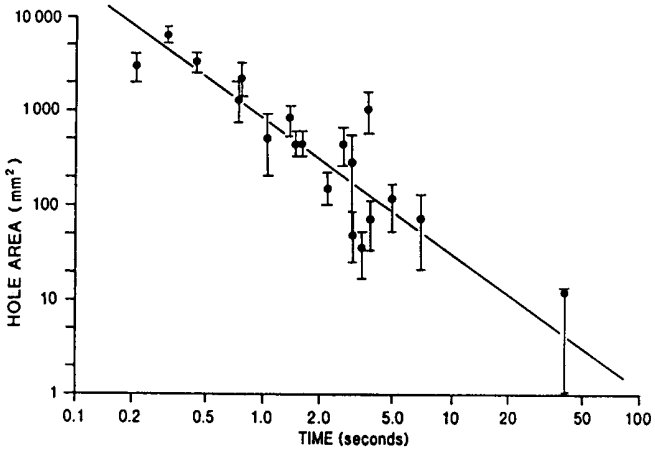


FIG. 1--The hole area in samples tested on the dummy plotted against the abrasion time in the new test (Log-Log plot; SEM).

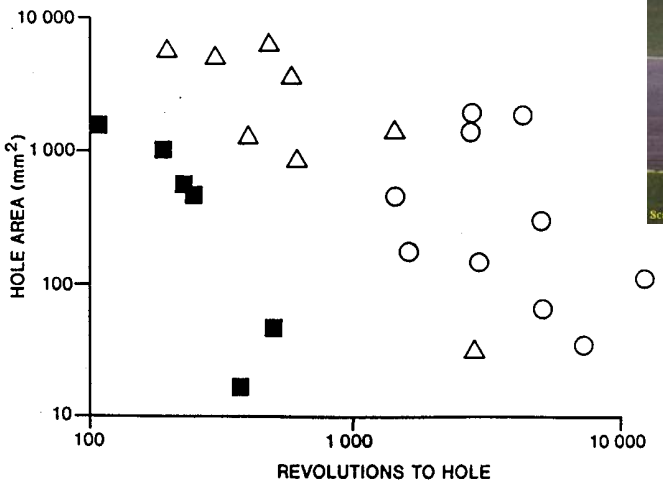
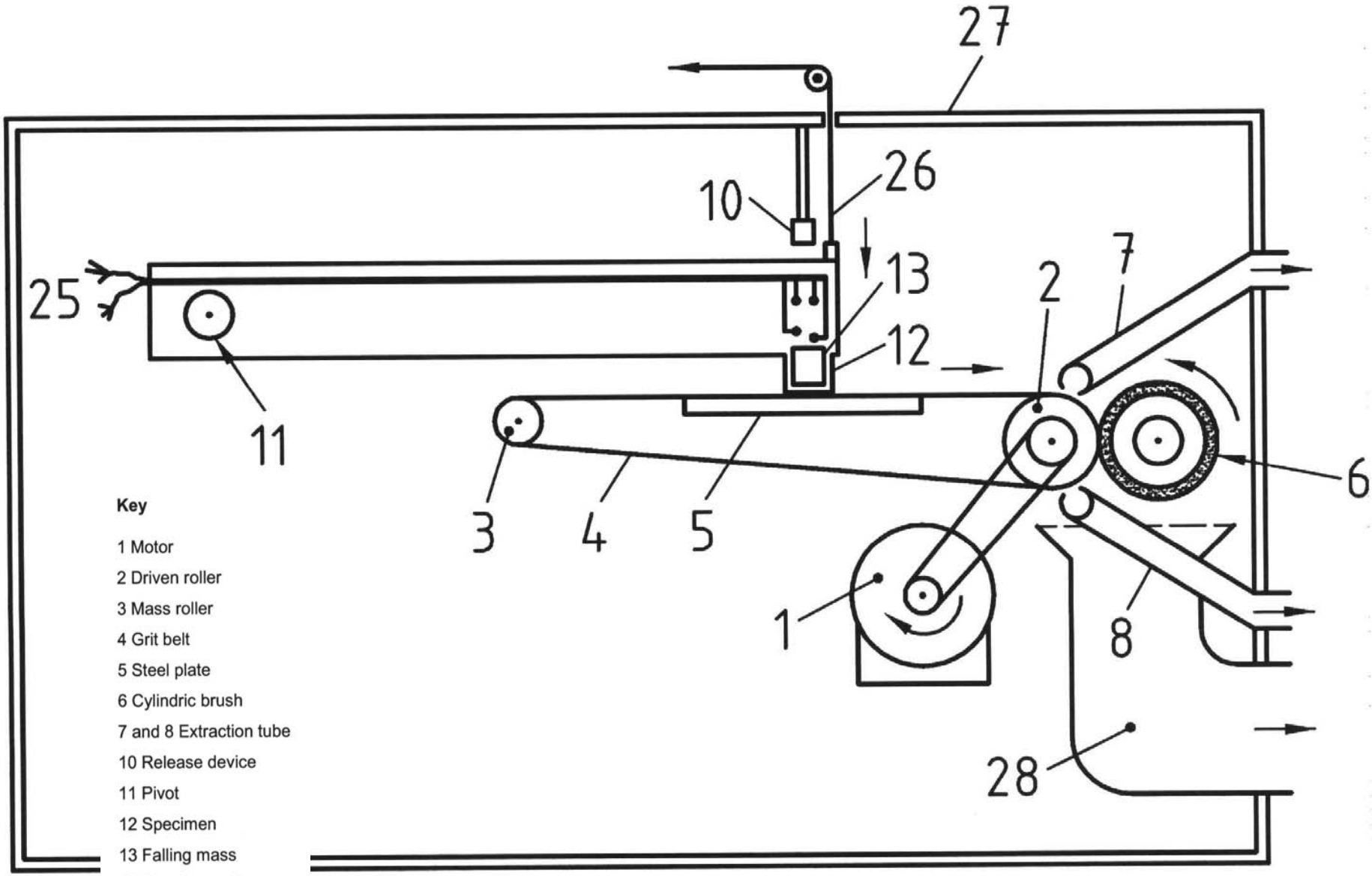


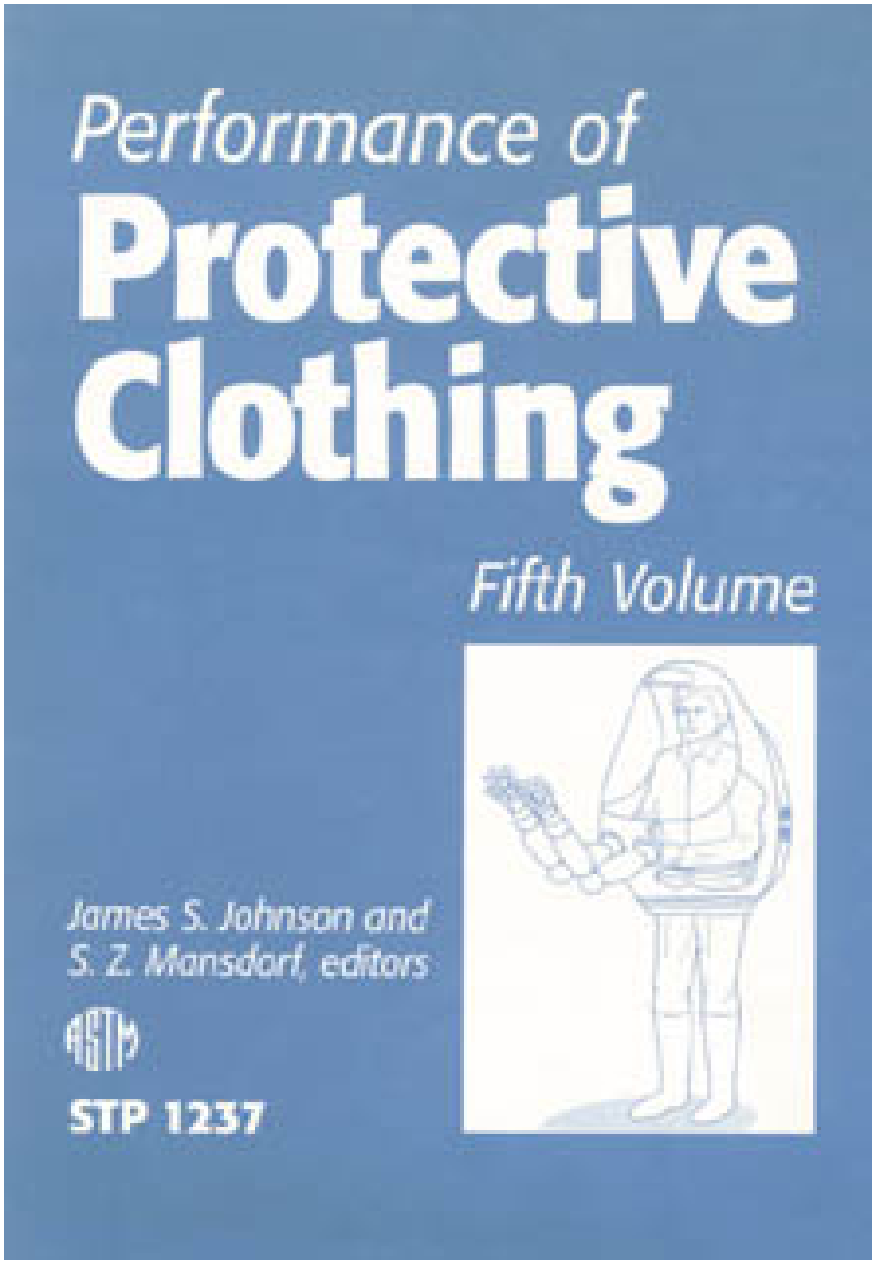
FIG. 2--The hole area in samples tested on the dummy plotted against the number revolutions to hole formation in the Taber abrader test.

○ leather, ■ aramid fabrics, △ other fabrics



Key

1 Motor
2 Driven roller
3 Mass roller
4 Grit belt
5 Steel plate
6 Cylindric brush
7 and 8 Extraction tube
10 Release device
11 Pivot
12 Specimen
13 Falling mass
25 Plugging to timer
26 Manual lifter
27 Overall cover
28 Dust extractor



Further information on the development of the test methods is available in this ASTM publication

Performance requirements of the CEN Standards

EN 13595 Parts 1 - 4

EUROPEAN STANDARD **EN 13595-1**

NORME EUROPÉENNE

EUROPÄISCHE NORM July 2002

ICS 13.340.10

English version

Protective clothing for professional motorcycle riders - Jackets, trousers and one piece or divided suits - Part 1: General requirements

Vêtements de protection pour les motocyclistes professionnels - Vestes, Pantalons et combinaisons une ou deux pièces - Partie 1: Exigences générales

Schutzkleidung für professionelle Motorradfahrer - Jacken, Hosen und ein- oder mehrteilige Anzüge - Teil 1: Allgemeine Anforderungen

This European Standard was approved by CEN on 6 April 2002.

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This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Management Centre has the same status as the official versions.

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COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: rue de Stassart, 36 B-1050 Brussels

Ref. No. EN 13595-1:2002 E

Table 1 — Minimum requirements for abrasion resistance

Zones	Abrasion resistance requirements s	
	Level 1	Level 2
1 and 2	4,0	7,0
3	1,8	2,5
4	1,0	1,5

4 Performance levels and principle of zoning

4.1 Performance levels

Two performance levels are specified for clothing providing protection against road surface impacts. These are as follows:

LEVEL 1: Clothing designed to give some protection whilst having the lowest possible weight and ergonomic penalties associated with its use;

LEVEL 2: Clothing providing a moderate level of protection, higher than that provided by level 1. There are, however, weight and restriction penalties in providing this level of protection.

Tensile strength testing

- in the laboratory and "in the field"

Other tests:

Dye-fastness

Restraint

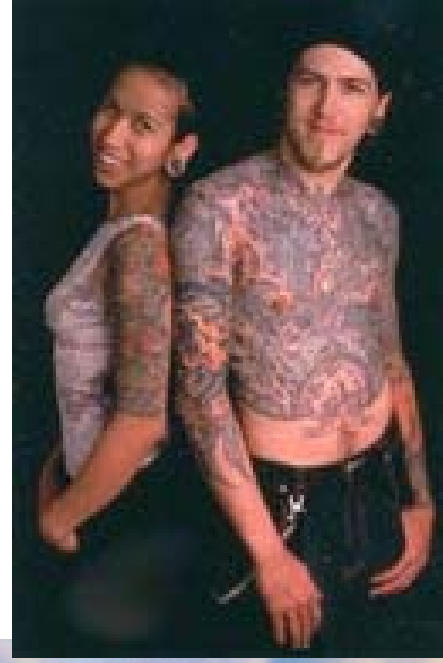
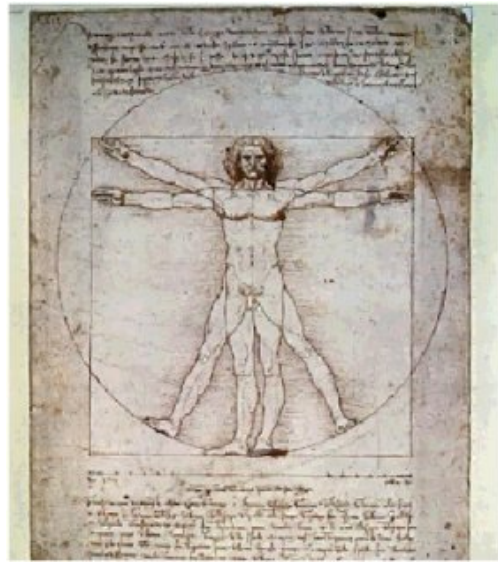
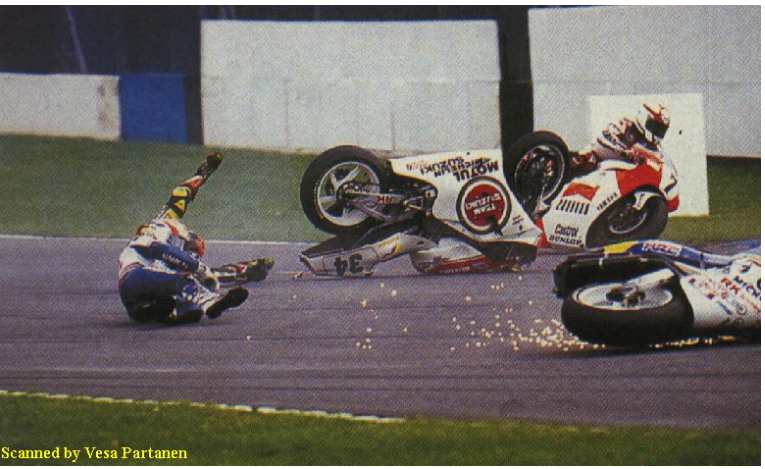


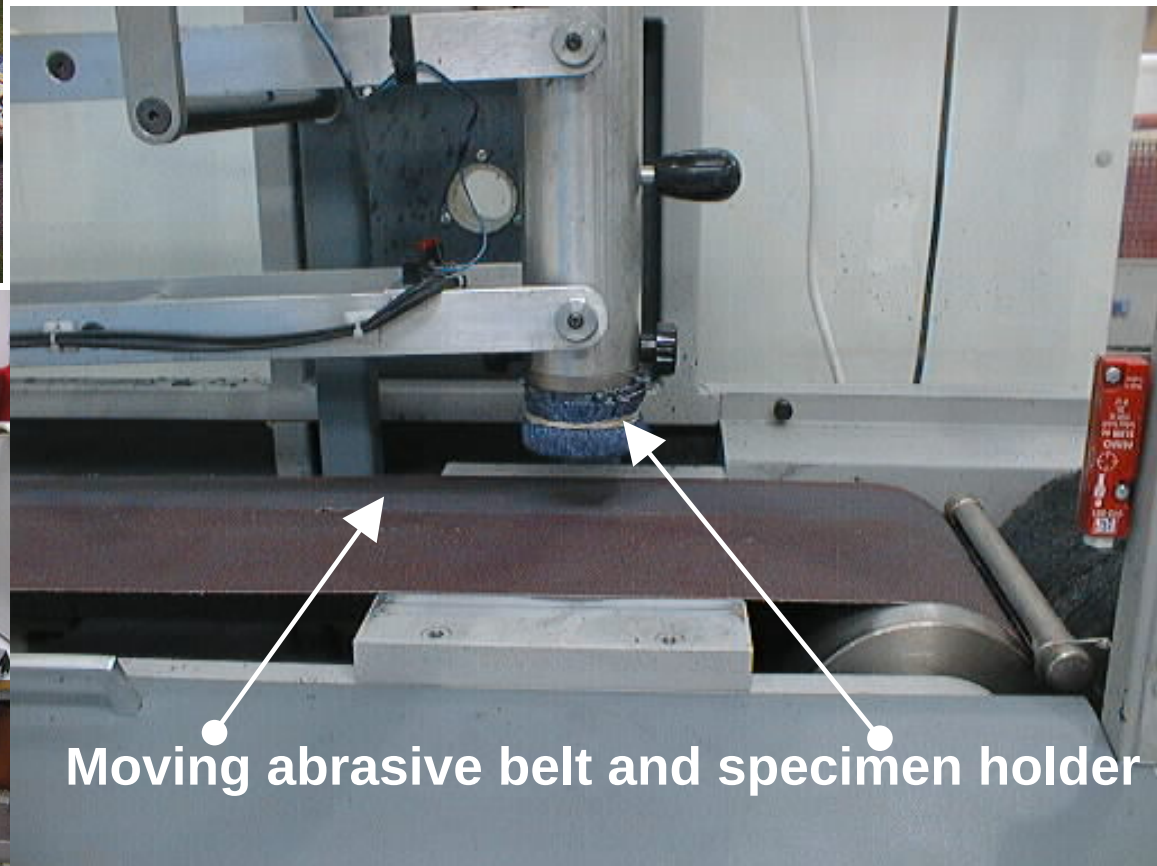
Image courtesy of Draggin' Jeans

... Fit and ergonomics

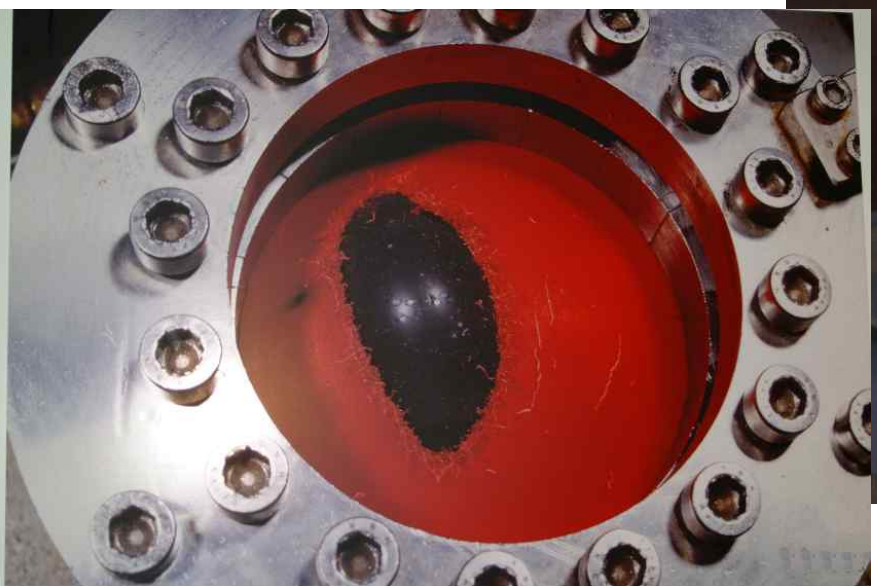


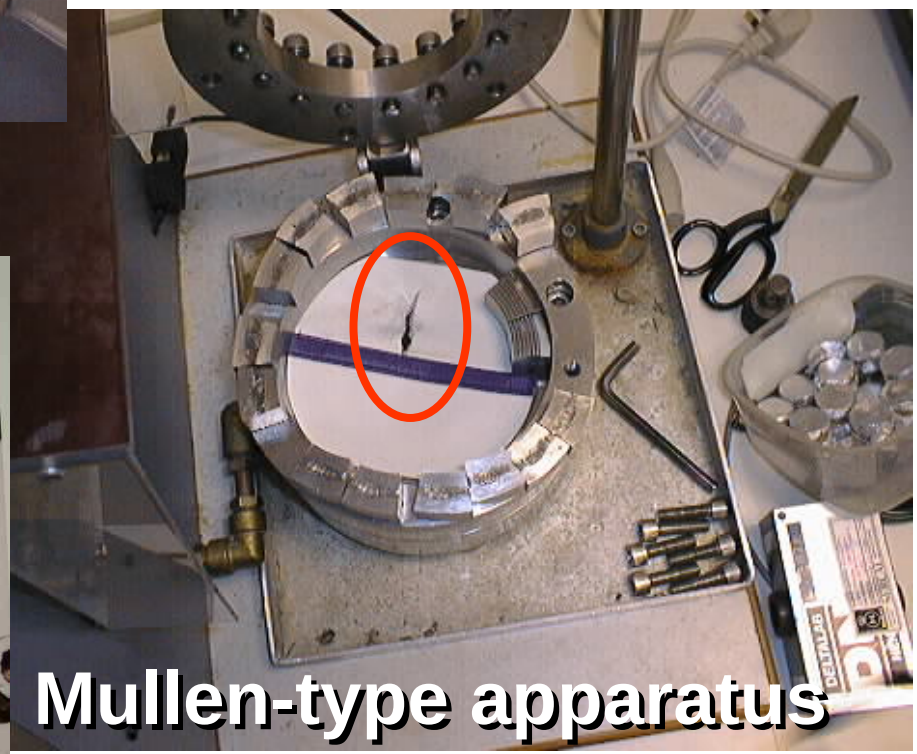
Impact abrasion testing (EN 13595-2)





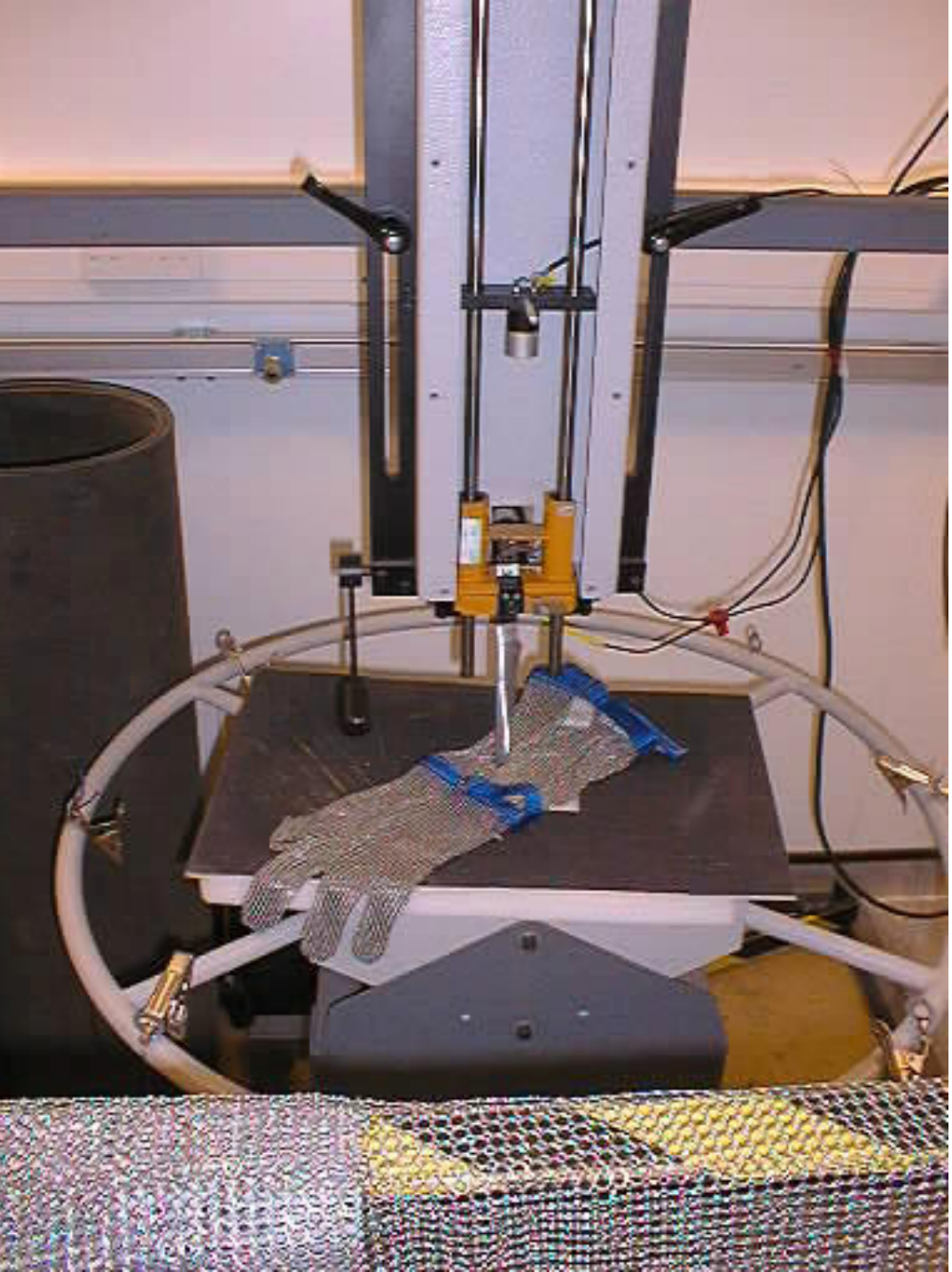
Burst strength testing (EN 13595-3)

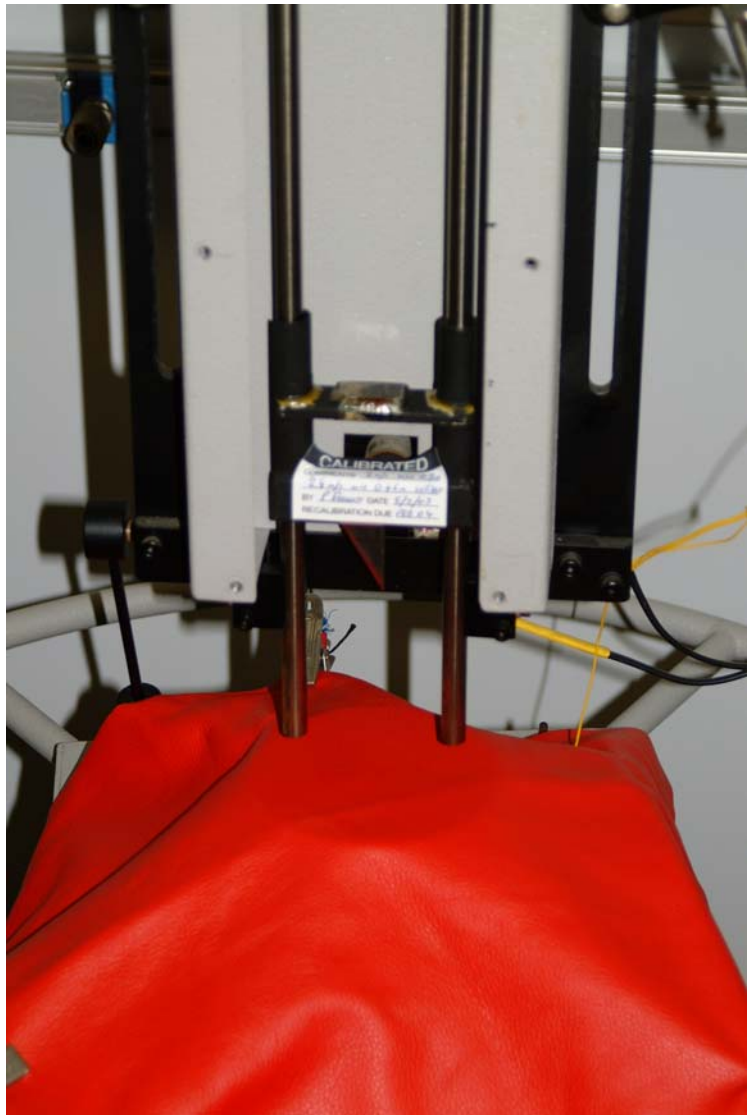




Mullen-type apparatus

Impact cut testing (EN 13595-4)





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Technical File Services Limited

Latest News

01.03.2006

New Website Launched! We hope you find it easier to navigate and even easier on the eye!

Welcome to the PVA Technical File Services Website!

Introduction

PVA Technical File Services Limited are internationally-respected, independently-accredited experts, specialising in the design, development, prototyping, testing, certification and verification of all forms of Personal Protective Equipment (PPE) for both civilian and non-civilian applications. We also advise end users, employers, manufacturers, representative bodies and Government agencies on PPE specification, selection and use.

We have experience in the design, development, prototyping, testing, certification and verification of personal protective equipment for Military, Police and Civilian applications. PVA is probably Europe's Leading Product Development and CE Marking Consultants

Examples of product types and groups where we have previously assisted clients with development and certification include:

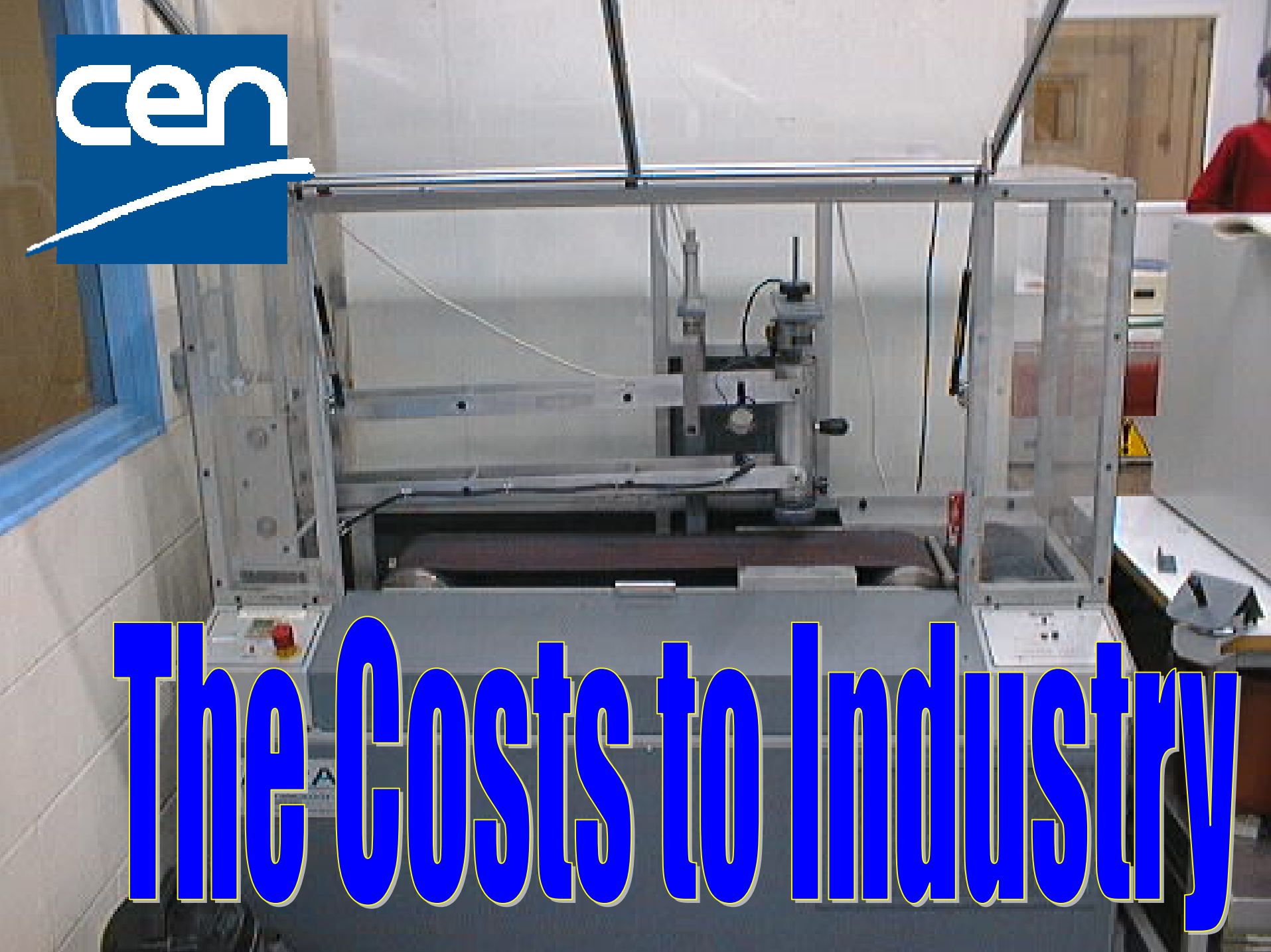
- Ballistic and stab protection
- Chemical, Bacteriological, Radiological and Nuclear (CBRN) protection
- Dynamic simulation training suits
- Football players' shin guards
- Foul weather clothing
- Helmets for cyclists and whitewater sports
- High visibility clothing
- Horse riders' body protectors
- Impact protection for "action sports"
- Inflatable body protection for motorcyclists
- Limb protectors and wrist supports for roller sports
- Motorcyclists' gloves
- Motorcyclists' protective clothing in leather and textile
- Motorcyclists' limb and back protectors
- Personal defence shields
- Riot protection for the police, military and other employees facing violent situations

Would you like to learn more?

Please use the drop down below to jump to a particular section of the website.

Designed by Sixth Sense ESP

Further detailed information on these test methods can be found by following the “Standards” menu at www.pva-ppe.org.uk



The Costs to Industry

EN 1621-1 (Impact protectors)

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 1

Decembe

ICS 13.340.10; 43.140

Descriptors: Personal protective equipment, accident preve motorcycli

Motorcyclists' protect ng nec
Part 1: Requirement methods for i

Vêtements de protection contre les chocs
mécaniques pour motocyclistes —
Partie 1: Exigences et méthodes d'essai des
protecteurs contre les chocs

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This European Standard by C nber
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$300

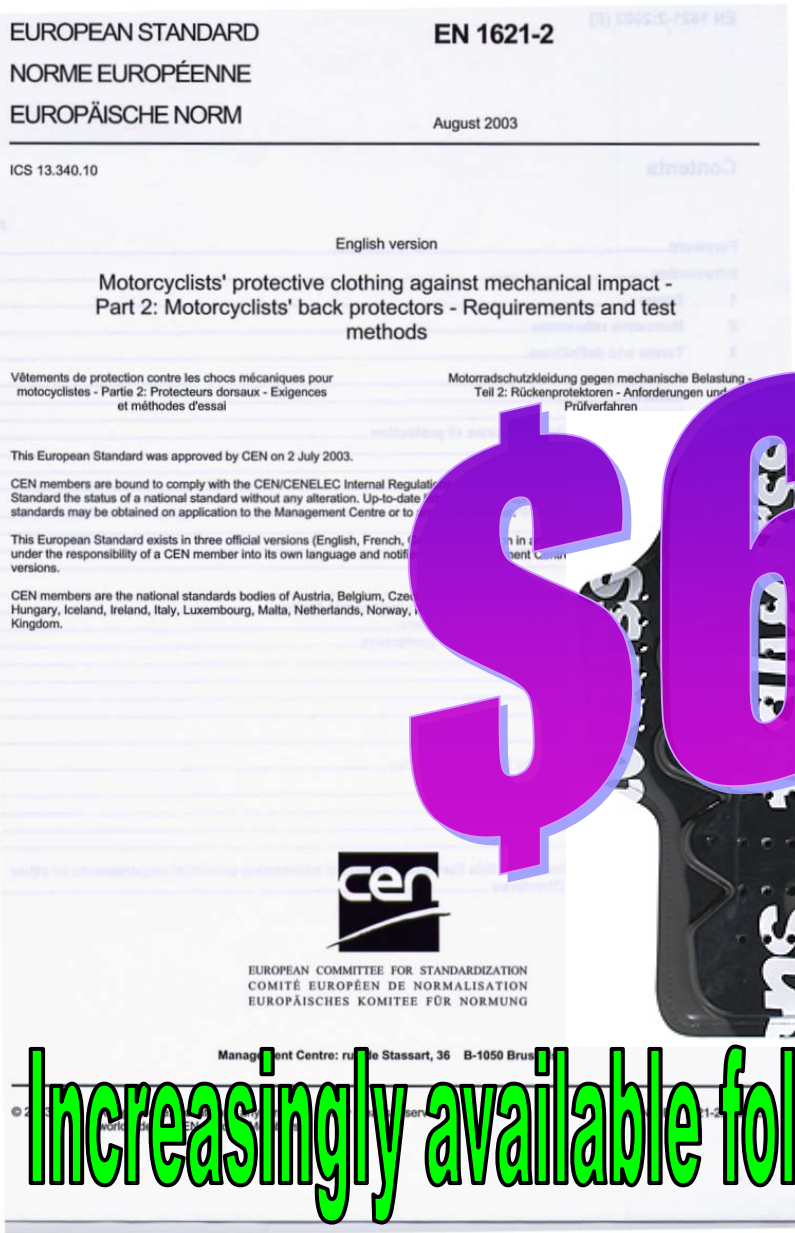
CEN

European Committee for Standardizat n

Ref. No. EN 1621-1:1997 E

Now commonplace in both types of "CE" garments!

EN 1621-2: Back protectors



EUROPEAN STANDARD **EN 1621-2**

NORME EUROPÉENNE

EUROPÄISCHE NORM August 2003

ICS 13.340.10

English version

Motorcyclists' protective clothing against mechanical impact - Part 2: Motorcyclists' back protectors - Requirements and test methods

Vêtements de protection contre les chocs mécaniques pour motocyclistes - Partie 2: Protecteurs dorsaux - Exigences et méthodes d'essai

Motorradschutzkleidung gegen mechanische Belastung - Teil 2: Rückenprotektoren - Anforderungen und Prüfverfahren

This European Standard was approved by CEN on 2 July 2003.

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CE

$600

Increasingly available following publication of EN 1621-2

EN 13595 Parts 1 - 4 (Garments)

$2000

Garments (EN 13595)

EN 13594 (Gloves)

EUROPEAN STANDARD **EN 13594**

NORME EUROPÉENNE

EUROPÄISCHE NORM July 2002

ICS 13.340.40

English version

Protective gloves for professiona torcycle rid
Requirements and t

Gants de protection pour motocyclistes professionnels -
Exigences et méthodes d'essai

This European Standard was approved by CEN on 25 March 2002.

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Management Centre: rue de Stassart, 36 B-1050 Brussels

Ref. No. EN 13594:2002 E

$3000

EN 13634 (Footwear)

$3500

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 13634

June 2002

ICS 13.340.50

English version

... ear for professional motorcycle riders - ... irements and test methods

... ssionnels

Schutzschuhe für professionelle Motorradfahrer - Anforderungen und Prüfverfahren

... 14 March 2002.

... /CENELEC Internal Regulations which stipulate the conditions for giving this European ... *any alteration. Up-to-date lists and bibliographical references concerning such national* ... Management Centre or to any CEN member.

... versions (English, French, German). A version in any other language made by translation ... into its own language and notified to the Management Centre has the same status as the official ...

... mbers are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, ... Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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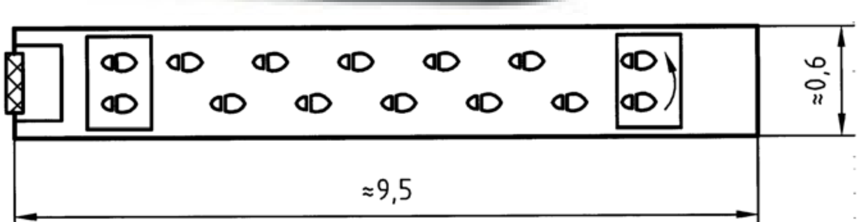


The availability of EN 13595 has motivated the development of

3 New Textile

Motorcyclists' apparel concepts

Three technological approaches:

1. Single heavyweight layer

   (For example, the heavyweight Cordura jackets and trousers as supplied to Pizza Hut's UK delivery riders)

2. Polyamide mechanical interlining as S.S.L.

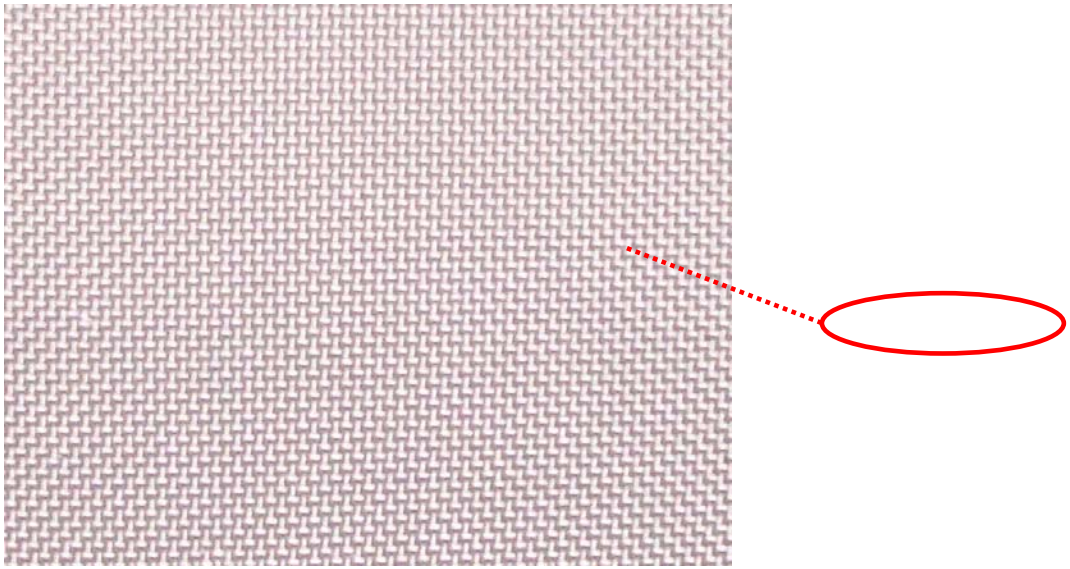
   (For example, the Scott Leathers jackets, supplied to the Metropolitan Police in London, and the developmental BKS jacket)

3. "Tritector" system of terry-knit + high-tenacity mesh

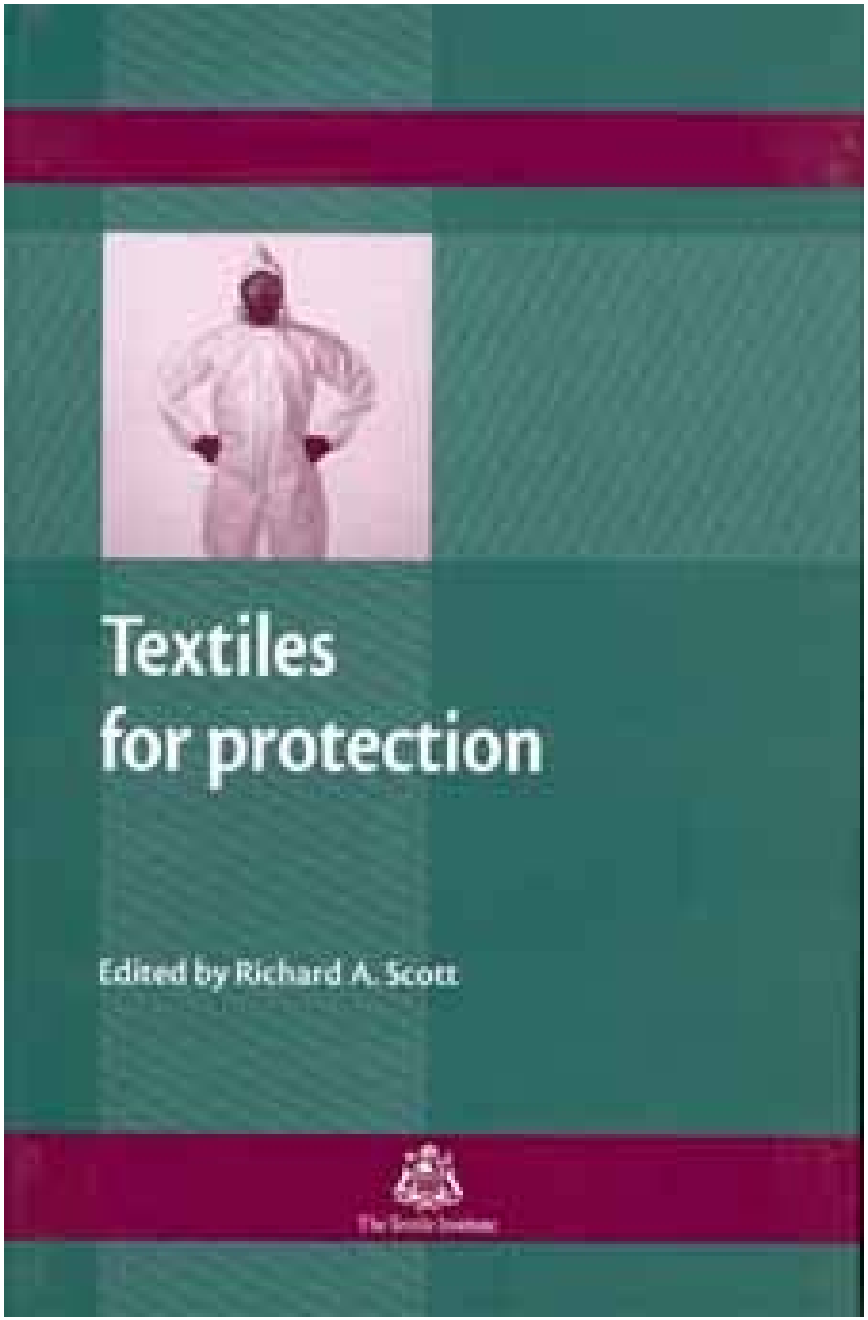
   (Halvarssons Safety Suit)

The first approach meets the "Level 1" performance requirements of EN 13595.
The second and third approaches either meet with or exceed the "Level 2" performance requirements of EN 13595.

These CE textile garment programme have also delivered innovation in non-PPE garment technology



Even in their *"Caveat Emptor"* apparel, some manufacturers are incorporating the lessons learned from their PPE development programmes



Further information on these textile clothing innovations can be found in “Textiles for Protection”

The benefits of producing motorcyclists' apparel to a stand

An independent [illegible]

Single te[illegible]ar[illegible]facturers

Improved [illegible]ic

Safeguar[illegible]gainst litigation (3rd party certifi[illegible]

Prospect of insurance disc[illegible]

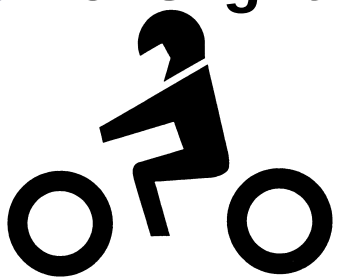
Motivation[illegible]forc[illegible]

Pos[illegible]st[illegible]les

Prev[illegible]luc[illegible]of slight injuries

Better products

Safer motorcyclists

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